

NEW RECORDS OF CAVE COLLEMBOLA OF MEXICO¹

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ABSTRACT: Thirty-five species of Collembola are recorded from eleven Mexican caves, nest of *Pappogeomys tylorhynus* and the fur of *Neotomodon* sp. and *Peromyscus alstoni*. A brief discussion about their ecological classification is included.

RESUMEN: 35 especies de Collembola son registrados de 11 cuevas mexicanas, nidos de *Pappogeomys tylorhynus* y ejemplares colectados sobre *Neotomodon* sp. y *Peromyscus alstoni*. Se hace una breve discusion sobre su clasificación ecológica.

Mexican caves have one of the most abundant and diverse cavernicole fauna of any region in the world (Reddell, 1981). This is due to the existence of huge cave systems, and to the geographic position and diversity of climates and vegetational communities.

Although springtails are usually well represented in any Mexican cave, frequently being the most abundant food source for other arthropods, there are few papers dealing with cave Collembola in Mexico.

The first reference dates from Mills (1938) who recorded seven species from Yucatan caves. Bonet (1943, 1944, 1945, 1946, 1947), Bonet and Tellez (1947) described several species; Christiansen (1973) described and recorded five species of *Pseudosinella*; and Bonet (1953, 1971) discussed the cave fauna in Mexico and gave new records. The latest records are those of Reddell (1971, 1981), Hoffman *et al* (1980) and Palacios-Vargas (1980). A tentative classification of some cavernicole Collembola, based on ecological, morphological and geographical data was presented by Palacios-Vargas (1981).

Apparently, there are two or three groups of cavernicole Collembola in Mexico. One group of Mexican troglomorph species are closely related to species inhabiting soil and litter in the same area.

Another group represents taxa abundant in temperate North America both in caves and in soil, which have extended to the south; the third group represent Neotropical fauna that has moved to habitats in southern Mexican caves.

Epigeomorphs and ambimorphs are interesting because some of them are probably relicts that survived in the caves thanks to the stability of these environments.

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The new records of Mexican caves Collembola given in this paper may assist in understanding the origin, distribution and evolutionary relationships of this group.

It has been found that some of the springtails known as cavernicolas can also live in rodent nests and these are not restricted to caves, rather, they are associated with guano or rodent feces.

The material involved in this study included samples provided by Héctor Guzmán, Sociedad Mexicana de Exploraciones Subterráneas de México; the author's collections and specimens from other collectors who are mentioned with the locality data.

The cavernicole classification used here for the springtails mainly follows that of Christiansen (1962).

ONYCHIURIDAE

Mesaphorura krausbaueri Börner, 1901.

GUERRERO: Grutas de Cacahuamilpa. 17-V-1977, J.G. Palacios col.

SAN LUIS POTOSÍ: Aquismón: Hoya de Guaguas. 6-II-81, H. Guzmán, col.

**M. yosii* Rusek, 1967.

VERACRUZ: Grutas de Atoyac. 6-XII-1981, V. Granados col.

GUERRERO: Grutas de Juxtlahuaca, 29-XI-1980, M.L. Jiménez col.

Mesaphorura sp.

EDO. DE MEXICO: Grutas de la Estrella. 27-V-80, J.G. Palacios, col.

Onychiurus encarpatus Denis, 1931.

QUERETARO: Sótano Otates. 7-IV-1981, H. Guzmán, col.*

HYPOGASTRURIDAE

Acherontides atoyacensis Bonet, 1945.

EDO. DE MEXICO: Ecatepec: Venta de Carpio. ex. nest of *Pappogeomys tylorhynus*, 27-VII-1980, V. Sosa col.

Acherontiella sabina Bonet, 1945.

D.F.: Ajusco. ex *Neotomodon* sp. y *Peromyscus alstoni*. April and May, 1978, E. Hentschel col.

VERACRUZ: Grutas de Atoyac. ex. guano. 12-XII-1981, V. Granados col.

Ceratophysella sp.

MORELOS: Cave at Km. 104, 5 FFCC México-Cuernavaca. 19-IV-1980 J.G. Palacios col.

Willemia persimilis Bonet, 1945

EDO. DE MEXICO: Venta de Carpio. ex. nest of *P. tylorhynus* 27-VII-1980, V. Sosa col.

GUERRERO: Gruta de Acuitlapán. 12-XII-1981, J.G. Palacios, col.

NEANURIDAE

Brachystomella parvula group (Schaeffer, 1896).

QUERETARO: Sótano Otates. 7-IV-1981, H. Guzmán col.

B. stachi Mills, 1934.

EDO. DE MEXICO: Venta de Carpio, ex. nest of *P. tylorhynus* 27-VII-1980, V. Sosa col.

*The species marked with an asterisk represent a new record for the country.

****Pseudachorutes subcrassoides* Mills, 1934.**

QUERETARO: Jalpan: Sotano Tilaco. 23-XII-1980, H. Guzman col.

****Sensillanura* sp.**

QUERETARO: Sótano Otates. 8-II-1981, H. Guzmán col.

ISOTOMIDAE***Ballistura* sp.**

GUERRERO: Grutas de Juxtlahuaca. 29-XI-1980, M.L. Jimenez col. 11-IV-1981, J.G. Palacios col.

***Cryptopygus thermophilus* (Axelson, 1900).**

QUERETARO: Sótano Tilaco. 21-XII-1980, H. Guzmán col.

***Folsomides americanus* Denis, 1931.**

GUERRERO: Grutas de Juxtlahuaca. 11-IV-1981, J.G. Palacios col.

QUERETARO: Sótano Tilaco. 21-XII-1980, H. Guzmán col.

***F. angularis* (Axelson, 1905)**

GUERRERO: Grutas de Juxtlahuaca. 11-IV-1981, J.G. Palacios col.

***Folsomina onychiurina* Denis, 1931.**

GUERRERO: Grutas de Juxtlahuaca. 11-IV-1981, J.G. Palacios col.

QUERETARO: Sótano Tilaco. 23-XII-1980, H. Guzmán col.

****Isotoma trispinata* MacGillivray, 1896.**EDO. DE MEXICO: Venta de Carpio, ex. nest of *P. tylorhynus* 27-VII-1980, V. Sosa col.***Isotomiella minor* (Schaeffer) 1896.**

VERACRUZ: Grutas de Atoyac. 6-XII-1981, V. Granados col.

****Proisotoma (Appendisotoma) dubia* Christiansen et Bellinger, 1980.**

SAN LUIS POTOSI: Aquismón: Hoya de Guaguas. 6-II-1981, H. Guzman.

****P. minuta* Tullberg, 1871.**EDO. DE MEXICO: Venta de Carpio, ex next of *P. tylorhynus* 27-VII-1980, V. Sosa col.**ENTOMOBRYIDAE*****Neorchesella mexicana* Mari-Mutt, 1980 (Mari-Mutt det.)**

TAMAULIPUS: Cueva Conrado Castillo. 19-IV-1980, P. Date col.

***Lepidocyrtus* sp.**

GUERRERO: Grutas de Juxtlahuaca. 11-IV-1981, J.G. Palacios col.

***Pseudosinella petrustrinatti* Christiansen, 1973.**

GUERRERO: Grutas de Juxtlahuaca. 16-II-1979, E. Martín and M. Cortés col.

***P. violenta* (Folsom) 1924.**

HIDALGO: Grutas de Tolantongo. 6-IX-1980, A. Hidalgo col.

Pseudosinella* sp. 1.**EDO. DE MEXICO: Venta de Carpio, ex. nest of *P. tylorhynus* 27-VII-1980, V. Sosa col.Pseudosinella* sp. 2**

VERACRUZ: Grutas de Atoyac. 6-XII-1981, V. Granados col.

***Seira* sp.**

VERACRUZ: Grutas de Atoyac. 6-XII-1981, V. Granados col.

CYPHODERIDAE***Cyphoderus* sp. nov.**

GUERRERO: Grutas de Juxtlahuaca. 11-IV-1981, J.G. Palacios col.

PARONELLIDAE***Paronella* sp.**

GUERRERO: Grutas de Juxtlahuaca. 6-III-1979, E. Martín and M. Cortés col.

Troglopedetes sp. nov. A.

GUERRERO: Grutas de Juxtlahuaca. 11-IV-1981. J.G. Palacios col.

Troglopedetes sp. nov. B.

VERACRUZ: Grutas de Atoyac. 6-XII-1981, V. Granados col.

NEELIDAE

Megalothorax minimus Willem, 1900.

VERACRUZ: Grutas de Atoyac. 6-XII-1981, V. Granados col.

SMINTHURIDIDAE

Sphaeridia sp. A.EDO. DE MEXICO: Venta de Carpio. ex nest of *P. tylorhynus* 27-VII-1980, V. Sosa col.***Sphaeridia*** sp. B.

GUERRERO: Grutas de Juxtlahuaca. 11-IV-1981, J.G. Palacios col.

Discussion

The most abundant Onychiuridae belong to the group *Mesaphorura krausbaueri* and further studies should reveal endemic forms.

Acherontiella sabina was described by Bonet (1945) from caves of San Luis Potosí and was found in caves of Nuevo León and Tamaulipas. It also has been recorded from Kangaroo Rat nests (Christiansen and Bellinger, 1980), from Santa Fe, New Mexico; and here it is reported from the fur of the rodents *Neotomodon* and *Peromyscus alstoni*, from Ajusco, D.F. This leads us to think that some carvernicoles springtails, mainly those associated with guano, can be transported by accidental phoresis from one cave to another by the rodents.

Acherontides atoyacensis from Cueva de Atoyac, Veracruz (Bonet, 1945), has been found in one basaltic cave from Morelos State (Palacios-Vargas, 1981) and in Gruta de Aguacachil, Guerrero (Palacios-Vargas, 1982). Our new record from nests of *P. tylorhynus* implies that this species is not restricted really to caves but that it might be associated with the feces of rodents.

Ceratophysella sp. and *W. persimilis* are trogloxene, the first hemidaphic and the second euedaphic. All the neanurids seem to be trogloxene.

The family Isotomidae includes very few troglomorphs. Although this is the best represented family in the caves here in studied, the species represent a fauna which also lives outside the caves and they should be considered as ambimorphs or epigeomorphs.

N. mexicana and *Seira* sp. are trogloxenes. The undescribed Cyphoderids and Paronellids are better representatives of trogomorphs.

Neelids are euedaphic or ambimorphs and the Sminthurids troglomorphs belongs to *Arrhopalites* and *Pararrhopalites*, which were not found in the caves recorded in this paper.

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